AUTHOR INDEX

Beckenbach, J. R. *See* **Wadleigh, C. H.,** Robbins, W. R., and.

Bodily, H. L. *See* **Smith, F. B.,** Brown, P. E., Millar, H. C., and.

Bouyoucos, G. J. The dilatometer method for determining the moisture equivalent of soils, 385–389.

Bray, R. H. Chemical and physical changes in soil colloids with advancing development in Illinois soils, 1–14.

Brown, B. E., and Reid, F. R. Formamide and ammonium formate as nitrogen sources for plants, 341–347.

Brown, P. E. *See* **Smith, F. B.,** and Millar, H. C.

Brown, P. E. *See* **Smith, F. B.,** Millar, H. C., and Bodily, H. L.

Caldwell, M. J. *See* **King, H. H.,** and Perkins, A. T.

Coile, T. S. Composition of the leaf litter of forest trees, 349–355.

Eddins, A. H., and Scoville, W. H. Sampling soil for the pH determination, 219–220.

Emmert, E. M. A rapid method for determining soil moisture, 31–36.

Foster, J. W. *See* **Waksman, S. A.**

Gardner, R. A method of measuring the capillary tension of soil moisture over a wide moisture range, 277–283.

Gourley, J. H. *See* **Havis, L.**

Gustafsson, Y. *See* **Mattson, S.**

Haas, A. R. C. Boron-deficiency effects similar in general appearance to bark symptoms of psorosis in citrus, 317–325.

Haenseler, C. M., and Moyer, T. R. Effect of calcium cyanamide on the soil microflora with special reference to certain plant parasites, 133–151.

Havis, L., and Gourley, J. H. Soil organic matter and porosity of an orchard soil under different cultural systems, 413–420.

Hoon, R. C. *See* **Puri, A. N.**

Hoseh, M. Heat of wetting of some soil colloids at different moisture contents, 257–275.

Hutchings, I. J. *See* **Waksman, S. A.**

Jarusov, S. S. On the mobility of exchangeable cations in the soil, 285–303.

Jeffries, C. D. The mineralogical composition of the very fine sands of some Pennsylvania soils, 357–366.

Joffe, J. S. A pedologic study of some soils in New Jersey, 221–238.

Keaton, C. M. The influence of lead compounds on the growth of barley, 401–411.

King, H. H., Caldwell, M. J., and Perkins, A. T. Replaceable base determination by electro-migration, 311–316.

Livingston, B. E., and Norem, W. L. Water-supplying power and water-absorbing power of soils as related to wilting of wheat and coleus in greenhouse pot cultures, 177–204.

Mail, G. A. Accuracy of a soil thermograph, 27–30.

Mathur, P. B. *See* **Singh, B. N.**

Mattson, S., and Gustafsson, Y. Laws of soil colloidal behavior: XVIII. Colloidal electrolytes, 421–452.

Mattson, S., and Gustafsson, Y. Laws of soil colloidal behavior: XIX. The gel and the sol complex in soil formation, 453–473.

Millar, H. C. *See* **Smith, F. B.,** Brown, P. E., and.

Millar, H. C. *See* **Smith, F. B.,** Brown, P. E., and Bodily, H. L.

Mitscherlich, E. A. The "chemical analysis" of the soil, 253–255.

Moyer, T. R. *See* **Haenseler, C. M.**

Nevros, K. I., and Zvorykin, I. A. The variety of solonetz red soils in the vicinity of the village of Marcopoulo, Attica, 239–246.

Nikiforoff, C. C. General trends of the desert type of soil formation, 105–131.

Norem, W. L. *See* **Livingston, B. E.**

Okada, Y. Occurrence of masses of gelatinous microbes in the soil, 367–373.

Perkins, A. T. *See* **King, H. H.,** Caldwell, M. J., and.

Prince, A. L., and Toth, S. J. Electrodialysis and cation exchange studies on soils of varying organic matter content, 205–217.

Puri, A. N., and Hoon, R. C. Studies in the electrodialysis of soils: I. Electrodialysis by the rotating electrode, 305–309.

Puri, A. N., and Sarup, A. The use of collapsible tubes for storing soil samples for moisture estimation, 375–376.

Reid, F. R. *See* **Brown, B. E.**

Robbins, W. R. *See* **Wadleigh, C. H.**, and Beckenbach, J. R.

Salminen, A. A handy borer for soil surveyors, 377–378.

Sarup, A. *See* **Puri, A. N.**

Scoville, W. H. *See* **Eddins, A. H.**

Sideri, D. I. On the formation of structure in soil: III. Mechanism of the swelling of soil, 43–49.

Singh, B. N., and Mathur, P. B. Apparatus for the measurement of shrinkage coefficient of soils, 37–41.

Smith, F. B., Brown, P. E., and Millar, H. C. Some effects of carbon dioxide on the decomposition of organic matter and the accumulation of nitrates in the soil, 15–26.

Smith, F. B., Brown, P. E., Millar, H. C., and Bodily, H. L. The effect of carbon dioxide on soil reaction and on the solubility of phosphorus in soils, 93–104.

Staker, E. V. *See* **Wilson, B. D.**

Stoeckeler, J. H. A new jack for pulling soil-sampling tubes, 379–383.

Toth, S. J. *See* **Prince, A. L.**

Turnage, W. V. Notes on accuracy of soil thermographs, 475–476.

Wadleigh, C. H., Robbins, W. R., and Beckenbach, J. R. The relation between the chemical nature of the substrate and the degree of chlorosis in corn, 153–175.

Waksman, S. A. Associative and antagonistic effects of microorganisms: I. Historical review of antagonistic relationships, 51–68.

Waksman, S. A., and Foster, J. W. Associative and antagonistic effects of microorganisms: II. Antagonistic effects of microorganisms grown on artificial substrates, 69–76.

Waksman, S. A., and Hutchings, I. J. Associative and antagonistic effects of microorganisms: III. Associative and antagonistic relationships in the decomposition of plant residues, 77–92.

Wilson, B. D., and Staker, E. V. Ionic relationships in peat, 247–252.

Winogradsky, S. The doctrine of pleomorphism in bacteriology, 327–340.

Zvorykin, I. A. *See* **Nevros, K. I.**

SUBJECT INDEX

Acidity, exchange, 448
Acidoid-basoid ratio, discussion, 459
Acids—
  colloidal, 421
  soluble, precipitation of, 431
Actinomyces—
  antagonistic, action of, 73
  cyanamide (calcium) effect on, 135
  lime effect on, 88
  nutrient salt effect on, 88
Alfalfa, decomposition of, by microorganisms, 81
Alkalinity, exchange, 448
Aluminum, effect on isoelectric point, 461
Ammonia, as a nitrogen source for corn, 157
Ammonium sulfate, a comparison of, with other nitrogen sources, 344
Anionic sol and gel complex, 435
Aphanomyces root rot of peas, treating the soil for, 145
Ash in forest litter, 352
Bacteria—
  antagonistic action of, 56, 70
  cyanamide (calcium) effect on, 135
  pleomorphism of, 327
Barley, effect of lead compounds, 401–409
Base, *see* also Cation
  exchange, relation to mineral nature, 12
  replaceable, determination by electromigration, 311–316
Bases, colloidal, 421
Boron deficiency effects, 317

BOOK REVIEWS

Agriculture, English Farming Past and Present, 392–393
Agriculture, The Earth Goddess, 397
Ayres, Q. C. Soil Erosion and Its Control, 391
Bacteriology, Agricultural, Handbuch der Landwirtschaftlichen Bakteriologie, 479
Bacteriology and Immunity, the Principles of, 480
Bassett, E. M. Zoning, 394
Chemistry, Annual Survey of American, 478–479
Chemistry, Fundamentals of Qualitative Chemical Analysis, 477–478
Clarke, G. R. The Study of the Soil in the Field, 396
Crops, Field (Rasteniya Polevoi Kultury), 477
Dietetics, Applied, 480–481
Economics, Elements of Farm Management, 398–399
Ernle, Lord, English Farming Past and Present, 392–393
Fairchild, D. Exploring for Plants, 394–395
Gardening, The Vegetable Gardener's How Book, 395–396
Hopkins, J. A. Elements of Farm Management, 398–399
Italy, Land-Reclamation in, 391–392
Jones, G. H. The Earth Goddess, 397
Land-Reclamation in Italy, 391–392
Löhnis, F. Handbuch der Landwirtschaftlichen Bakteriologie, 479
Longobardi, C. Land-Reclamation in Italy, 391–392
McAlpine, R. K., and Soule, B. A. Fundamentals of Qualitative Chemical Analysis, 477–478
Plants, Exploring for, 394–395
Pryanishnikov, D. N., and Yakushkin, I. V. Rasteniya Polevoi Kultury (Field Crops), 477
Rothamsted Experimental Station Report for 1935, 397–398
Russell, E. J., and Voelcker, J. A. Fifty Years of Field Experiments at the Woburn Experimental Station, 393–394
Sherlock, C. C. The Vegetable Gardener's How Book, 395–396
Soil Erosion and Its Control, 391
Soil Mapping, Die Böden Des Deutschen Reiches und der Freien Stadt Danzig, 398
Soil, The Study of the Soil in the Field, 396
Soule, B. A. See McAlpine, R. K.
Stern, F. Applied Dietetics, 480–481

Stremme, H. Die Böden Des Deutschen Reiches und der Freien Stadt Danzig, 398
Topley, W. W. C., and Wilson, G. S. The Principles of Bacteriology and Immunity, 480
Voelcker, J. A., *See* Russell, E. J.
West, C. J., Editor. Annual Survey of American Chemistry, 478–479
Wilson, G. S. *See* Topley, W. W. C.
Woburn Experimental Station, Fifty Years of Field Experiments at the, 393–394
Yakushkin, I. V. *See* Pryanishnikov, D. N.
Calcium—
content of forest litter, 354
cyanamide, effect on—
soil-borne plant pathogens, 136
soil microflora, 133–151
soil reaction, 135
Capillary-pressure deficit of soils, 181
Capillary tension of soil moisture, method of measuring, 277
Carbon dioxide—
effect on—
organic matter decomposition, 15
nitrate accumulation, 15, 21
soil, 16
soil reaction, 93
phosphorus solubility in soils, 93
in soil air, 16
Carbon-nitrogen ratio in forest litter, 350, 352
Cation exchange—*see* also Base exchange
capacity of inorganic fraction of soils, 5
in peat, 248
in soils of varying organic matter, 205
in various sized colloid fractions, 11
of 13 soil profiles, 221
Cationic sol and gel complex, 435
Cations, exchangeable, mobility of, 285
Citrus, boron deficiency in, 317
Club-root, effect of calcium cyanimide and hydrated lime on, 137
Colloidal—
behavior, the laws of soil, 421, 453
electrolytes, 421
hydroxides, behavior, 431
Colloids—*see* also Soil colloids
amphoteric, nature of, 430, 438
base-exchange capacity of superfine, 13
chemical composition of soil, 7–12
composition of soil, on mobility of exchangeable cations, 289
Colloids—(*continued*)
fractionation of soil, 5
heat of wetting of, 257
isoelectric precipitation of, 429, 431
per cent of, in 5 soil series, 2
physical change and composition of, 9
weathering effects on shale, 12
Corn—
chlorosis, 153
stalks, decomposition of, 83
tissue and juices analysis, 156
Cucumbers, damping-off of, control, 143
Desert—
cementing materials in, soils, 115
crust, 112
flora and fauna, symbiosis between, 111
geomorphological features of the, 105
pavement, 113
type of soil formation, 108
versus steppe type of soil formation, 109
Dilatometer for moisture equivalent determination, 386
Electrodialysis—
of peat, 247
of soils, 305, 429
Electrolytes, colloidal, 421
Electromigration method of determining replaceable bases, 311
Electrophoresis of soil complexes, 454
Exchange acidity, alkalinity, and neutrality, 448
Feldspars in soils, 364
Fertilizer—
ammonium formate as, 342
formamide as, 342
urea as, in comparison with other nitrogen sources, 343
Forest trees, composition of leaf litter of, 349–355
Formamide as a source of nitrogen for plants, 341
Fungi—*see* also Microorganisms
antagonistic action of, 53, 70, 81
cyanamide (calcium) effect on, 135
Hardpan—
claypan and, 121
relation to desert crust, 113, 117, 119
theory of, formation in desert soils, 115, 117, 119
Heat of wetting—
colorimeter for the determination of, 275
of soil colloids, 257
Hornblende in soils, 364

Humates, aluminum and iron, 429
Humus—
  composition of mixtures of, and soil, 456
  function of, in soil, 460
Hydrogen, exchangeable, mobility of, 287
Hydrogen-ion concentration—
  carbon dioxide effect on, of soils, 99
  effect on—
    nitrogen source for plants, 157
    plant sap composition, 160
  of 13 soil profiles, 221
  relation to corn chlorosis, 161
  soil sampling for, 219
Iron, effect of, on isoelectric point, 461
Iron oxide in soils, 364
Isoelectric—
  iron and aluminum relation to, point, 461
  point, relation to dispersion of acidic and basic fraction of soil complex, 459
  weathering, 459
Kaolinization, process of, 121
Lead compounds, effect of, on barley, 401
Lime—
  effect on—
    actinomyces, 88
    carbon dioxide in soil air, 17
    nitrate accumulation, 21
    phosphate solubility, 97
  hydrated, effect on club-root, 137
Magnesium, variation of, in colloid fractions, 10
Microorganisms—*see* also Bacteria, Fungi, and Protozoa
  alfalfa decomposition by, 80
  associative and antagonistic effects of, 51–68, 69–76, 77–92
  gelatinous, in the soil, 367–371
Millet, nitrogen sources in fertilizers for, 345
Mineral composition of very fine sands of Pennsylvania soils, 357
Minerals, occurrence of various, in some Pennsylvania soils, 362
Moisture—
  content of soil colloids and heat of wetting, 257
  equivalent—
    dilatometer method for determining, 385
    capillary tension at, 282
  method of determining soil, 31
  soil, capillary tension of, 277–283
  storing capacity of soils, method, 282
Muscovite in soils, 364
Nitrate—
  accumulation, effect of carbon dioxide on, 15, 21
  as a nitrogen source for corn, 157
  in plant sap, 166
  nitrogen for corn plants in relation to chlorosis, 169
Nitrogen content of litter, 351
Oats—
  nitrogen sources in fertilizers for, 343
  straw decomposition, 87
Organic matter—
  cation exchange of soils of varying, 205
  content at various depths, 416
  content, effect on mobility of exchangeable ions, 289
  decomposition of, as affected by carbon dioxide, 15–25
  electrodialysis of soils of varying, 205
  in orchard soils, 413
  in various sized colloid fractions, 11
  presence of, in cathode and anode chambers upon electrodialysis of peat, 251
Parasites, plant, in soil, effect of calcium cyanimide on, 133
Peat—
  electrodialysis of, 247
  ionic relationships in, 247
Phosphate—
  as affected by—
    carbon dioxide in the soil, 93
    straw additions, 97
  effect on—
    carbon dioxide in soil air, 17
    nitrate accumulation, 21
  rock, *see* Rock phosphate
Phosphorus—
  corn chlorosis and, content of plants, 162
  in soil for maximum yield, 254
  solubility in soils, 93
Plant—
  availability of exchangeable cations to the, 299
  barley, effect of lead on, 404
  formamide and ammonium formate as a source of nitrogen for the, 341
  parasites, effect of calcium cyanimide on, 133
  roots, supplying power of the soil adjacent to the, 197

Plant—(*continued*)
sap—
chlorosis and composition of sap, 167
composition, relation of pH to, 160
concentration of substrate on pH of, 167
phosphorus content of, 167
wilting and water-supplying power of soils, 177
Potassium—
effect on pH in relation to carbon dioxide, 99
in soil for maximum yield, 254
variation of, in colloid fractions, 10
Protozoa, soil population and, 61
Pythium, treatment for, 141
Quartz in soils, 364
Rhizoctonia, treatment for, 141
Rock phosphate, effect on pH of soil in relation to carbon dioxide, 99
Rutile in soils, 364
Silicic acid—
function of, in soil, 462
reaction of, in soil, 435
Soil—
air, carbon dioxide in, 16
analyses, importance of, 253
borer, description of, 377
carbon dioxide in, *see* Carbon dioxide
chemical analysis of, 253
classification—
solonchak in the system of, 112
types of, formation and, 124
colloids—*see* also Colloids
amphoteric nature of, 443
chemical and physical changes in, 1–14
heat of wetting of, 257
stability of, 302
desert type of, formation, 105–131; *see* also Desert
erosion, method of measuring, 229
formation—
desert type of, 105
gel and sol complex in, 453
principal types of, 124
principle of, 437
glei, in the brown podzolic type, 227
hardpan, *see* Hardpan
materials, mutual neutralization of, 442
microorganisms—*see* also Microorganisms
antagonistic action of, 57
as affected by calcium cyanamide, 133
minerals, separation of, 359
mixtures, titration curves of, 445
Soil—(*continued*)
moisture—*see* also Moisture and Water
capacity, method of determining, 282
capillary tension of, 277
method for determining, 31–36
tubes for storing samples for, determination, 375
orchard, organic matter of an, 413
parasites in, 133
porosity of an orchard, 413
profile—
analyses of the, of 13 soil series, 221
clay analyses in, of red soils in Greece, 241
constitution and agrological attributes, 228
development of, 2
erosion and depth of, 229
features of the desert type, 107
glei podzolic, 227
podzol, 442
protozoa and microbiological population, 61
reaction, as affected by—
calcium cyanamide, 135
carbon dioxide, 93
requirement for nutrients, 254
samples for moisture determination, 375
sampling tubes, jack for pulling, 379
series, analyses or description—
Aiken, 258
Altamont, 258
Carrington loam, 98
Chester gravelly loam, 225
Cisne silt loam, 1
Collington loam, 223
Dekalb clay loam, 358
Dekalb sand, 358
Dover loam, 224
Dutchess loam, 224
Gloucester gravelly loam, 225
Grundy silt loam, 1
Hagerstown silt loam, 226, 358
Harrison silt loam, 1
Hartsburg silt loam, 1
Lackawanna sandy loam, 358
Lakewood fine sand, 227
Penn silt loam, 226
Putnam silt loam, 1
Sassafras fine sandy loam, 227
Sassafras loam, 223
Sassafras sand, 227
Tama silt loam, 101
Vina, 258

Soil—(*continued*)
series, analyses or description—(*continued*)
Volusia clay loam, 358
Washington loam, 224
Wooster silt loam, 419
Yolo, 258
shrinkage, apparatus for measuring, 38
steppe type of, formation, 109
structure—
as affected by electrolytes, 45
formation of, 43–49
surface, vegetation on, 368
swelling, 43
temperature, method of determining, 35
testing the, for nutrients, 253
thermograph, accuracy of, 27–30, 475
volume weight of, method of determining, 417
water—*see* also Water, Moisture
absorbing power tests, 188
absorption pressure, 181
supplying power and wilting, 177–204
Soils—
Benares, moisture and shrinkage, 40
capillary pressure deficit of, 181
chernozem, mobility of calcium and hydrogen in, 288
dilatometer method for determining moisture equivalent in, 285
electrodialysis of, 247, 305
gray-brown forest, mobility of calcium and hydrogen in, 288
Greece red solonetz, 239
humus-glei, mobility of calcium and hydrogen in, 288
hygroscopic coefficient of, 282
lead extraction from, 402
mineralogical composition of very fine sandy, 357
New Jersey, pedologic study of, 221–238
Soils—(*continued*)
of alluvial fans, characteristics of, 107
pedologic study of, 221
Pennsylvania, 357
phosphorus solubility in, 93
podzolic, 221, 288
red (lateritic), mobility of calcium and hydrogen in, 288
red solonetz, 239
sampling of, for pH determination, 219
shrinkage coefficient, 37–41
solonchak—*see* Solonchak
solonetz, *see* Solonetz
Solonchak—
development of, 116
solonetz and, in the desert, 122
Solonetz—
red, soils in Greece, 239
solonchak and, in the desert, 122
water absorption by, 46
Straw—
effect on—
carbon dioxide in soil air, 17
nitrate accumulation, 21
phosphate solubility, 97
Tourmaline in soils, 364
Water—
absorption by soils, 47, 180
supplying and absorbing power of soils and wilting, 177
Weathering, effect on composition of colloids, 12
Wheat—
nitrogen sources in fertilizers for, 345
wilting of, and water-supplying and absorbing power of soils, 177
Wilting coefficient and hygroscopic coefficient, 282
Yeasts, antagonistic action of, 55
Zircon in soils, 364